

What is Claimed is:

1. A liquid crystal display panel having an active area, comprising:
a plurality of gate lines formed on a substrate in one direction;
a plurality of data lines crossing the gate lines; and
5 a plurality of repair lines crossing a predetermined number of the data lines twice
and crossing the gate lines in the active area.
2. The liquid crystal display panel as recited in claim 1, the repair lines comprising a
first portion which crosses one end of the predetermined number of the data lines, a second
portion which crosses the other end of the predetermined number of the data lines, and a third
10 portion which connects the first and second portions together and which crosses the gate lines
in the active area.
A liquid crystal display panel having an active area, comprising:
a plurality of gate lines formed on the substrate in horizontal direction;
a plurality of data-line blocks, each including at least one of data lines which are
15 formed on the substrate in vertical direction crossing the gate lines; and
a plurality of repair lines crossing the data lines of a data-line block twice and
crossing the gate lines in the active area, wherein a repair line is formed for each data-line
block.
4. The of liquid crystal display panel as recited in claim 3, wherein all the data lines of
20 the data-line block cross twice at least one of the repair lines.
5. The liquid crystal display panel as recited in claim 4, the repair line
comprising a first portion which crosses one end of the data lines, a second portion which
crosses the other end of the data lines, and a third portion which connects the first and second
portions together and which crosses the gate lines in the active area.
- 25 6. The liquid crystal display panel as recited in claim 5, wherein the third

portion of the repair line which crosses the data lines of a data-line block is placed in close proximity to one of the data lines of the data-line block.

7. The liquid crystal display panel as recited in claim 6, wherein the third portion of the repair line which crosses the data lines of the data-line block is placed in
5 between two of the data lines of the data-line block.

8. The liquid crystal display panel as recited in claim 5, wherein the first and second portions of the repair line which cross the data lines of a data-line block cross twice the data lines of an adjacent data-line block adjacent to the data-line block.

9. The liquid crystal display panel as recited in claim 8, wherein one of the
10 two repair lines crossing the data lines of a data-line block crosses the data lines from inside of the other repair line, and the former repair line crosses the data lines of an adjacent data-line block adjacent to the data-line block from outside of another repair line crossing the data lines of the adjacent data-line block.

10. The liquid crystal display panel as recited in claim 5, wherein a data-line
15 block has three data lines.

11. The liquid crystal display panel as recited in claim 10, wherein the three data lines in a data-line block are red, green, and blue data lines, respectively.

12. The liquid crystal display panel as recited in claim 11, wherein the third portion of the repair line is placed adjacent to the green data line of the data-line block.

20 13. The liquid crystal display panel as recited in claim 12, further comprising a first connection connecting the green data line and the third portion of the repair line.

14. The liquid crystal display panel as recited in claim 13, wherein the first connection connects the mid-points of the third portion of the repair line and the green data line.

25 15. The of liquid crystal display panel as recited in claim 14, further comprising

a second connection connecting the upper parts of the third portion of the repair line and the green data line and a third connection connecting the lower parts of the third portion of the repair line and the green data line.

16. A method of repairing data lines of a liquid crystal display having a plurality of gate lines in one direction and a plurality of data lines crossing the gate lines in an active area of the liquid crystal display, comprising the steps of:

forming a plurality of repair lines, each crossing both ends of at least one of the data lines and crossing the gate lines in the active area; and

shorting the crossing points of the repair line and a first-disconnected data line.

17. The method as recited in claim 16, wherein the data lines are grouped into the data-line blocks having at least one data line, and all data lines of a first data-line block are crossed by a first repair line and by a second repair line which crosses all the data lines of a second data-line block adjacent to the first data-line block.

18. The method as recited in claim 17, further comprising the step of: shorting the crossing point of the second repair line and a second-disconnected data line of the first data-line block including the first disconnected data line shorted to the first repair line.

19. The method as recited in claim 16, wherein the data lines include red, green, and blue data lines; and further comprising the step of forming a connection between the green data line and the repair line.

20. The method as recited in claim 19, further comprising the step of disconnecting the connection when the first disconnected data line is the red or blue data line for transmitting red or blue picture signals.

21. A method of repairing data lines of liquid crystal display having a plurality of duplicate gate lines including primary and secondary gate lines, and data lines crossing the duplicate gate lines, comprising the steps of:

forming a plurality of repair lines each of which cross both ends of at least one of the data lines and cross the duplicate gate lines in the active area;

shorting a first and a second crossing points of a disconnected data line and the repair line;

5 shorting a third crossing point of the secondary gate line and the disconnected data line and a fourth crossing point of the secondary gate line and the repair line shorted to the disconnected data line; and

separating a portion of the secondary gate line between the third crossing point and the fourth crossing point from the rest of the secondary gate line.

10 22. The method as recited in claim 21, wherein the disconnected data line is a line for transmitting green picture signal.

23. The method of repairing of data line as recited in claim 21, wherein the primary gate lines are connected to switching devices.

24. A method of repairing a data line of liquid crystal display having a plurality
15 of duplicate gate lines including primary and secondary gate lines, and a plurality of data lines crossing the duplicate gate lines, comprising the steps of:

forming a plurality of repair lines which are parallel to the data lines and cross the duplicate gate lines;

20 shorting a first-upper, a first-middle, and a first-lower crossing points between a disconnected data line and three of the secondary gate lines;

shorting a second-upper, a second-middle, a second-lower crossing points between the repair line and the secondary gate lines shorted to the disconnected data line; and

separating portions of the secondary gate lines defined by the crossing points of the first-upper and the second-upper points, the first-middle and the second-middle points,
25 and the first-lower and the second-lower points, from other portions of the secondary gate

lines.

25. The method as recited in claim 24, wherein each repair line is formed adjacent to a data line transmitting green picture signals.

26. The method as recited in claim 25, wherein the first-upper and the second-
5 upper crossing points are on the uppermost secondary gate line, and the first-lower and the second-lower crossing points are on the lowermost secondary gate line.

27. The method as recited in claim 26, wherein the first-middle and the second-middle crossing points are on the secondary gate line in the middle.

28. A method of repairing a data line of liquid crystal display having a plurality
10 of duplicate gate lines including a primary gate line and a secondary gate line, and a plurality of data lines crossing the duplicate gate lines, comprising the steps of:

forming a plurality of repair lines which are parallel to the data lines and cross the duplicate gate lines;

shorting a first-above crossing point between a disconnected data line and a
15 secondary gate line above the point of disconnection and a first-below crossing point between the disconnected data line and a secondary gate below the point of disconnection;

shorting a second-above crossing point between the repair line and the secondary gate line above the point of disconnection and a second-below crossing point between the repair line and the secondary gate line below the point of disconnection;

20 separating portions of the secondary gate lines defined by the crossing points of the first-above and the second-above points and the first-below and the second-below points, from other portions of the secondary gate lines; and

separating a portion of the repair line defined by the crossing points of the second-above points and the second-below points from other portions of the repair line.

25 29. The method of repairing a data line as recited in claim 28, wherein each

repair line is placed adjacent to a green data line.

30. A liquid crystal display, comprising:

a plurality of duplicate gate lines, each having a primary gate line and a secondary gate line;

5 a plurality of data lines that are insulated from the primary and the secondary gate lines and cross the primary and secondary gate lines;

a plurality of connections connecting the primary gate lines and the secondary gate lines; and

10 a plurality of repair data lines that are arranged in parallel to the data line and that cross the duplicate gate lines.

31. A liquid crystal display, as recited in claim 30, wherein a predetermined number of pixels are grouped in a pixel unit and the connection is formed each for the pixel unit.

15 32. A liquid crystal display as recited in claim 31, wherein the pixel unit includes a red pixel, a blue pixel, and a green pixel.

33. A liquid crystal display as recited in claim 30, wherein the connection overlaps with the pixel electrode and generates storage capacitance.

20 34. A liquid crystal display as recited in claim 30, wherein a predetermined number of pixels are grouped into a pixel unit and the data repair line is formed each for a pixel unit.

35. A liquid crystal display as recited in claim 34, wherein the data repair line is placed adjacent to a green data line.